



A meta-analysis of the efficacy of osteopathic lymphatic techniques on peripheral edema in pregnancy

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Introduction

- The lymphatic system is composed of various lymphoid organs, tissues, and vessels that play a key function in maintaining homeostasis for the circulatory and immune systems.¹
- When it becomes overwhelmed, several pathologic or physiologic conditions can arise and present with symptoms, such as limb swelling, skin changes, pain, joint stiffness, and infection,¹ which are exacerbated with physiologic dynamics of pregnancy.
- Application of Osteopathic Principles and Practices and Osteopathic Manipulative Treatment (OMT) with lymphatic techniques have been shown to be effective in targeting this system to restore or facilitate functionality by treating somatic dysfunctions that may inhibit optimal lymphatic flow.¹
- Pregnant patients present a unique opportunity to utilize these techniques, especially due to the common occurrence of related peripheral edema that can substantially affect their quality of life.
- In recent studies, osteopathic lymphatic drainage techniques were found to be effective in reducing pain, fatigue, and edema of the lower limbs of pregnant women, and continues to be an ongoing topic of interest.²⁻⁵
- We aim to conduct a **meta-analysis** to specifically **investigate whether osteopathic lymphatic techniques offer effective complementary treatment of peripheral edema in pregnancy** compared to standard prenatal care alone.

Question

Do osteopathic lymphatic techniques offer effective complementary treatment of peripheral edema in pregnancy, compared to standard prenatal care alone?

Methods & Materials

- Prospective clinical studies or randomized controlled trials on edema and pain reduction in pregnancy were identified from PubMed, EBM review, and OstMed databases.
- Studies were extracted per the following inclusion criteria:
 - Published within the last 10 years
 - Sample size of ≥ 20 participants
 - Study participants included pregnant patients with peripheral edema
 - Intervention group subject to osteopathic or manual lymphatic techniques
 - Comparison with a control group
 - Primary outcomes of interest were based on reduction of peripheral edema and associated symptoms by measuring ankle circumference and/or pain severity
- All calculations and graphs were created in Microsoft Excel.
- Mean differences between treatment and control groups were charted on a forest plot with upper and lower confidence intervals.

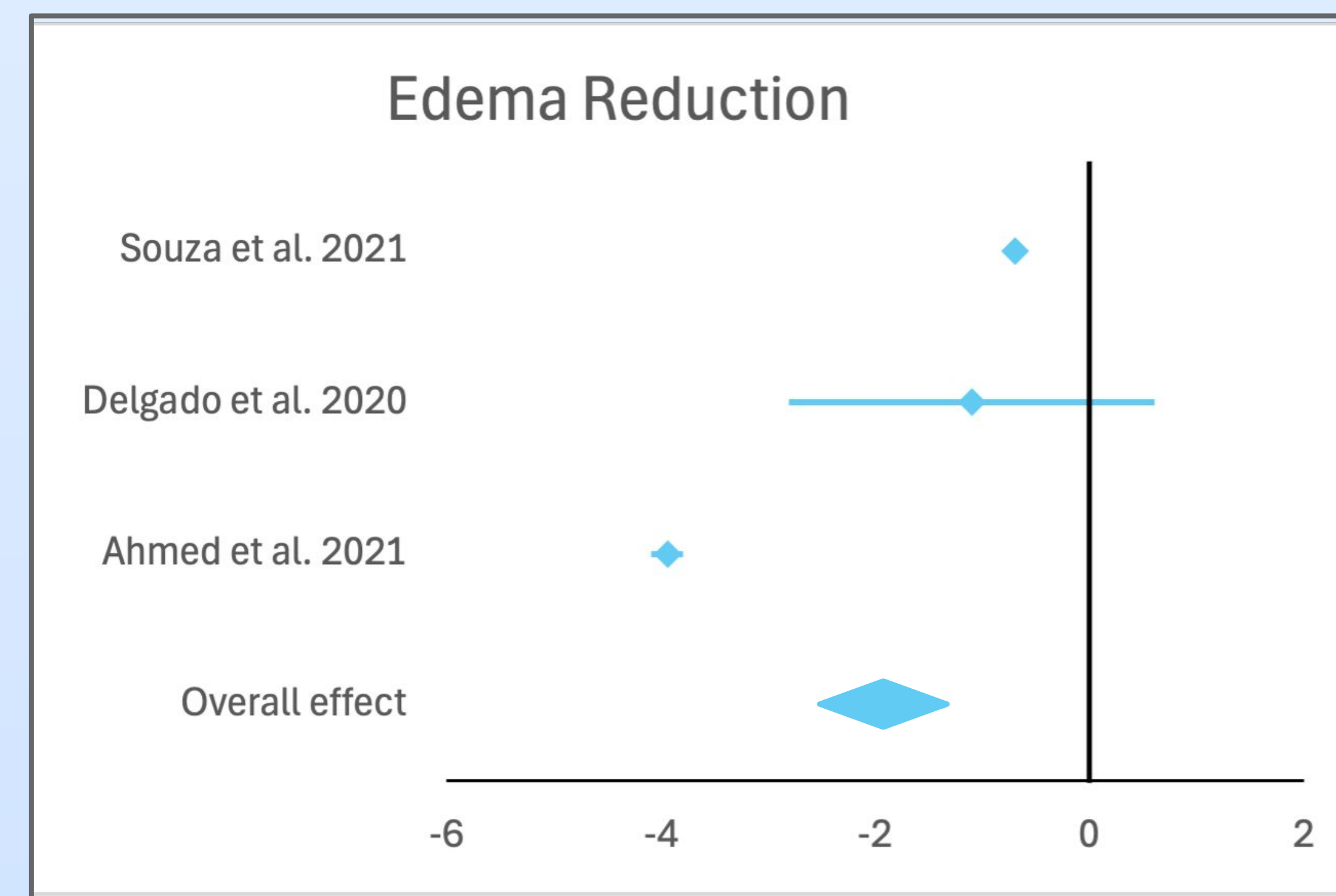


Figure 1. Forest plot of the pooled effect of manual lymphatic drainage versus control on reduction of lower extremity edema in pregnant women. Individual study estimates are represented by squares. Horizontal lines indicate 95% confidence intervals (CIs). The diamond represents the overall pooled effect size, with its width reflecting the 95% CI.

Results

- Our meta-analysis identified 3 studies, with a total of 103 participants, measuring edema reduction: Souza *et al.* (2021), Delgado *et al.* (2020), and Ahmed *et al.* (2021).^{2-3,5}
- 3 studies, with a total of 92 participants, analyzed pain scores: Souza *et al.* (2021), de la Cueva-Reguera *et al.* (2020), and Delgado *et al.* (2020).²⁻⁴
- Our pooled analysis demonstrated statistically significant edema reduction, with a **mean percentage decrease in ankle circumference by 13.5% ($p = 0.008$)**, comparing the intervention to the control groups.
- **Pain scores** in the intervention groups also decreased by a statistically significant **mean percentage decrease of 79.0% ($p = 0.006$)**, compared to the control groups.
- We computed a large pooled effect size (**Cohen's $d \approx -1.20$, 95% CI: - 1.28 to - 1.12**) in the intervention group, compared to standard care alone.

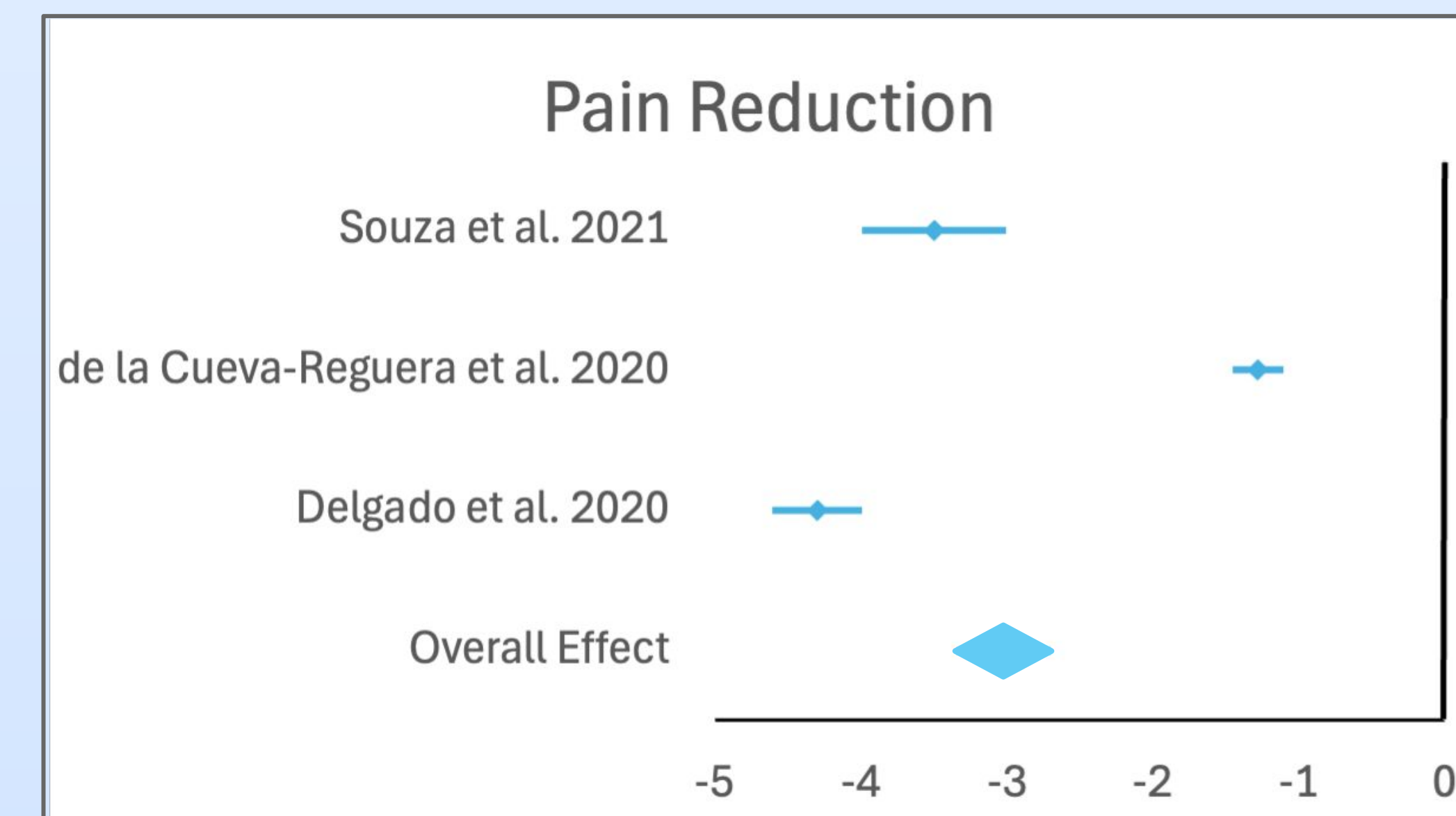


Figure 2. Forest plot of the pooled effect of manual lymphatic drainage versus control on pain in pregnant women. Individual study estimates are represented by squares, with horizontal lines indicating 95% confidence intervals (CIs). The diamond represents the overall pooled effect size, with its width reflecting the 95% CI.

Discussion

- The present study supports the current literature, suggesting that osteopathic lymphatic techniques may offer significant benefit in reducing peripheral edema and associated pain, reflected by a large pooled effect size and statistically significant outcomes.
- Our collective meta-analysis of the current literature demonstrates that osteopathic lymphatic techniques reduce edema and provide maternal pain relief during the prenatal period.²⁻⁵
- Limitations to this meta-analysis include small sample sizes, lack of long-term follow ups, and lack of standardized care. The current analysis is constrained by small sample sizes and methodological variability.
 - Larger studies are required to establish treatment guidelines and validate effectiveness.

Conclusion

- Peripheral edema is common pregnancy complication and can greatly impair maternal quality of life.
- Emerging studies suggest that **osteopathic or manual lymphatic techniques result in moderate improvements in peripheral edema.**²⁻⁵
- **OMT is a safe, adjunctive treatment for managing peripheral edema in pregnancy.**
- Further research should include randomized-control trials with larger sample sizes and standardized treatment protocols to further evaluate efficacy and patient improvement.

References

1. Hruby RJ, Martinez ES. The Lymphatic System: An Osteopathic Review. *Cureus*. 2021 Jul 17;13(7):e16448. doi: 10.7759/cureus.16448. PMID: 34422479; PMCID: PMC8368056.
2. Delgado A, de Queiroz Araújo DL, da Mata MJL, Batista da Costa HM, da Cruz Silva G, Rattes C. Effectiveness of manual lymphatic drainage with or without the use of functional bandaging on pain, fatigue and edema of the lower limbs in pregnant women: clinical, controlled and randomized trial. *O Mundo da Saúde*. 2020;4(17):217–228. doi:10.15343/0104-7809.202044217228
3. Souza SM, Silva RS e, Baldon VSP, Campos EC, Silva RM, Resende APM. Impact of the manual lymphatic drainage on symptoms related to lower-extremity edema in pregnant women. *Fisioter Pesqui*. 2021;28(4):376–379. doi: 10.1590/1809-2950/19030328042021
4. de la Cueva-Reguera M, Rodríguez-Sanz D, Calvo-Lobo C, Fernández-Martínez S, Martínez-Pascual B, Robledo-Do-Nascimento Y, Blanco-Morales M, Romero-Morales C. Effectiveness of manual lymphatic drainage vs perineal massage in secundigravida women with gestational oedema: a randomised clinical trial. *Int Wound J*. 2020 Oct;17(5):1453–1461. doi:10.1111/iwj.13427
5. Ahmed AH, Ismail NIA, Hassan NMM. Effect of effleurage massage versus water immersion with exercise on physiological foot edema among primigravidae. *Egypt J Health Care*. 2021 Jun;12(2):345–56. doi:10.21608/ejhc.2021.159852.